CLASSIFICATION ~~CONFIDENTIAL~~
~~SECURITY INFORMATION~~

CENTRAL INTELLIGENCE AGENCY
INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS

REPORT

CD NO.

STAT

COUNTRY	USSR
SUBJECT	Scientific - Medicine, noncellular forms of bacteria; bacteriophage
HOW PUBLISHED	Bimonthly periodical
WHERE PUBLISHED	Moscow
DATE PUBLISHED	Dec 1952
LANGUAGE	Russian

DATE OF INFORMATION 1952

DATE DIST. 19 May 1953

NO. OF PAGES 3

FOUO

SUPPLEMENT TO REPORT NO.

THIS IS UNEVALUATED INFORMATION

STAT

SOURCE Mikrobiologiya, Vol XXI, No 6, 1952, pp 721-733.

USSR INVESTIGATION OF NATURE OF BACTERIOPHAGE

/Comment: The following was taken from an article by V. A. Krestovnikova, V. I. Zhurbina, and N. B. Ismaylova, of the Institute of Microbiology, Epidemiology, and Infectious Diseases imeni I. Mechnikov, Moscow. According to the Soviet editor's comment, this contribution is a part of a discussion conducted by Mikrobiologiya on the subject of noncellular forms of microorganisms./

In view of the fact that bacteriophage exhibits all the properties of viruses, the problem of clarifying the nature of bacteriophage is at least as complex as that of establishing the nature of viruses. It seemed to the authors that a solution of the first problem, i.e., the nature of bacteriophage, will shed light on the problem of the connection between ultraviruses and filterable forms of bacteria.

To contribute to this solution, an immunological investigation of the antigenic properties of bacteriophage was carried out. The antibodies counteracting bacteriophage in antiphage serum were studied not only with respect to their action on the microbe that is subjected to lysis, as has been done hitherto, but also in relation to their effect on forms of this microbe that were as close as possible in their properties to filterable forms. It was expected that these forms would have a common antigen with bacteriophage. The fact that antibodies counteracting bacteriophage are independent of those acting on the microbes which are destroyed by the lytic action of the bacteriophage has been established by the work of many investigators, particularly as far as anticocci phages are concerned. Until now, however, no data were available on corresponding relationships which apply to other phages and to other forms of existence of microbes, particularly the so-called microforms and filterable forms.

CLASSIFICATION ~~CONFIDENTIAL~~

STATE	X	NAVY	X	NSRB		DISTRIBUTION	
ARMY	X	AIR	X	FBI			

By investigating antiphagins in antiphage sera, it was shown that the reaction of the neutralization of bacteriophage is highly specific and proceeds similarly to the toxin-antitoxin reaction.

The bacteriophages and bacterial cultures used in the present investigation are as follows.

The first series of investigations was carried out with bacteriophage that is active with respect to Proteus X19. One of the reasons for studying Proteus X19 and its bacteriophage was that an investigation of the connection between Proteus X19 and R. prowazeki had been conducted by the authors for several years prior to this work. Besides Proteus X19, its microform (Culture 597) was available. Culture 597 had been cultivated at the institute since 1942. There was also an analogous fresh culture (Microculture 46), isolated from the lungs of mice. Both killed and live R. prowazeki were available.

The second object of the investigation consisted of streptococci bacteriophage and strains of scarlet fever streptococci, the microscopically invisible stage of scarlet fever streptococci which had been isolated from patients, and SK [scalet fever] hemocultures.

The third object was composed of the bacteriophage of B. suipestifer, cultures of B. suipestifer, as well as the virus of hog cholera and cultures of [B.] suisepticus, which are often present in the septical form of hog cholera.

The fourth object was formed by typhoid bacteriophages and the corresponding O and VI cultures.

As the fifth object, dysentery bacteriophage and typical dysentery bacilli cultures, as well as atypical cultures isolated from the blood of patients, were selected.

The results of the investigation can be summarized as follows.

By adsorption on microbes, it is possible to extract from antiphage serum antibodies which specifically neutralize the corresponding bacteriophage. This proves that the microbe and the bacteriophage which corresponds to it have the same antigenic properties. When the microorganism on which the bacteriophage exerts a lytic action does not extract antibodies that act on this bacteriophage, one can find transition forms (stages of development) of the same microorganism which do exhibit this property. This, in turn, establishes that these microorganisms or forms of this microorganism belong to the same species.

According to the results obtained, Proteus X19, the scarlet fever streptococcus, and Flexner W dysentery bacilli are incapable of extracting the antiphagins of the corresponding bacteriophages, while R. prowazeki, Microculture 56, microscopically invisible scarlet fever streptococci cultures, the scarlet fever culture designated SK No 13, and atypical dysentery hemocultures do have the property of extracting the antiphagins of these bacteriophages.

On the other hand, B. suipestifer cultures which have not been modified and the majority of original VI and O strains of typhoid extract the antiphagins of the bacteriophages that correspond to them. This testifies to the fact that they have common antigens with these bacteriophages. In view of the fact that fixation of antiphagins is a specific reaction, it permits the establishment of the genetic relationship between viruses and microbes. An immunological study by the method of antibody adsorption of bacteriophages which act on specific types of microbes and of antiphage sera which are specific toward these bacteriophages may be applied for the purpose of investigating the

antigenic structure of microbes. All the facts which have been mentioned refute the basic and sole argument in favor of the assumption that bacteriophage is an exogenic virus which lives as a parasite on microbes. On the contrary, these facts indicate that bacteriophage is of endogenic origin with respect to microbes.

- E N D -